Short-Bio:

Thomas Schenkel graduated from the Institute of Nuclear Physics at the Goethe University Frankfurt, Germany, in 1993. The focus of his work in the group of Prof. K. Bethge was ion beam analysis of light impurities in semiconductors. He then joined the LLNL EBIT Ion Solid Interaction group of Dr. D. H. Schneider, and is currently completing his Ph. D. work on applications of slow highly charged ions beams for surface analysis and materials modification.

Title:

"Electronic Sputtering Effects in TOF-SIMS Studies Using Slow Highly Charged Primary Ions like Xe^{44+} and Au^{69+}"

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Abstract:
Hundreds of electrons are emitted when a single highly charged ion (HCI) approaches a surface, and bonds of surface adsorbades are broken very efficiently, yielding strongly increased numbers of secondary ions. Surface near bulk material is highly excited by the local loss of electrons, and it has long been suggested, that the lattice of insulators (e. g. 50 nm thick SiO_2 films) and poor conductors may relax in a "Coulomb Explosion", resulting in high yields of secondary particles, and mostly positive secondary ions. In this talk I will briefly review our current understanding of HCI solid interactions, and present recent results from Time of Flight-Secondary Ion Mass Spectrometry (TOF-SIMS) studies of secondary ion production mechanisms. I will discuss critical conditions for the onset of "Coulomb Explosions". Finally an outline of possible practical applications of TOF-SIMS with HCI from an Electron Beam Ion Trap (EBIT) will be given.

Short Abstract:
Recent results from Time of Flight-Secondary Ion Mass Spectrometry (TOF-SIMS) studies using primary beams of slow (v < vBohr) highly charged ions will be presented. Conditions for "Coulomb Explosions" will be discussed, and possible practical applications in surface analysis will be outlined.

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